JPRAS Open 3 (2015) 35–38

Contents lists available at ScienceDirect

JPRAS Open

journal homepage: http://www.journals.elsevier.com/jpras-open

Case report

Squamous cell carcinoma arising in a skin graft donor site following melanoma extirpation at a distant site: A case report and review of the literature

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ARTICLE INFO

Article history:
Received 16 December 2014
Accepted 3 February 2015
Available online 21 February 2015

Keywords:
Squamous cell carcinoma
Split thickness skin graft
Keratoacanthoma
Donor site

SUMMARY

The development of both squamous cell carcinoma (SCC) and keratoacanthoma (KA) in donor sites following split thickness skin graft harvest are rare complications reported in the literature. Management of such cases requires a precise distinction between keratoacanthoma and SCC and knowledge of the degree of differentiation.

We describe the case of a 48-year-old male who developed a squamous cell carcinoma with features of KA within a donor site on his right thigh. This developed six weeks following split skin graft harvest to cover a defect on his right anterior chest following wide local excision of a 2.4 mm Breslow thickness superficial spreading melanoma.

We review previous cases in the literature along with theories suggested for their development and conclude the development of SCC with features of KA in this reported case was likely a de novo lesion. This case highlights the need for evaluation of the donor site at all surveillance examinations of the primary tumor site and urgent diagnostic biopsy of all non-healing and new lesions.

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http://dx.doi.org/10.1016/j.jpra.2015.02.002

Case report

A 48-year-old male was initially referred from dermatology services with a histologically confirmed superficial spreading melanoma excised from his right anterior chest. This had a reported Breslow thickness of 2.4 mm with no ulceration, no lymphovascular or perineural invasion, absent regression and a mitotic count of 2 per mm^2. He had no relevant past medical history and reported limited sun exposure confined to Ireland. On assessment he had Fitzpatrick skin Type 1. There was no history of previous melanoma or non-melanoma skin cancer and also no relevant family history of note. He underwent a 2 cm wide local excision with split-thickness skin graft (STSG) harvested from right thigh and sentinel lymph node biopsy excised from right anterior chest wall. The wide local excision was initially interpreted as showing no microscopic evidence of residual melanoma on hematoxylin and eosin stain (H&E). However immunohistochemistry showed two separate sub millimeter foci of subcapsular tumor cells. One of these deposits was subsequently identified retrospectively in the H&E staining. This was discussed at multidisciplinary team (MDT) setting and it was agreed to place him in surveillance with three monthly axillary ultrasound examinations.

Initial donor site review at two weeks was satisfactory. Six weeks post surgery he developed a 1.5 cm by 0.5 cm nodular lesion at the superolateral aspect of his donor site [Figure 1]. Incisional biopsy was performed and invasive well-differentiated squamous cell carcinoma (SCC) with cytological features of keratoacanthoma (KA) was diagnosed [Figure 2a]. He underwent complete excision in November 2013. A well-differentiated, invasive squamous cell carcinoma that was fully excised was diagnosed. The tumor, which was 5.0 mm in diameter, extended into the reticular dermis (Clarke level IV) [Figure 2b].

Discussion

Keratoacanthoma (KA), an epithelial neoplasm, is considered a well-differentiated form of invasive SCC. Generally it can be differentiated from SCC on both clinical and histological grounds but despite novel diagnostic techniques the two pathologies remain closely related.[1] Although originally thought to have a natural tendency towards regression, aggressive and metastatic behavior has been reported in the context of KA. This has prompted a more cautious approach with most advocating surgical excision as first-line therapy alike the surgical management of SCC.[2]

The development of SCC in donor sites following split skin graft harvest is rare.[3] To date there are only eleven documented cases ($n = 11$) in the literature (Table 1). Considering the initial histology in this case had features of KA we included four further cases of reported KA in donor sites.[4,5] In total one

Figure 1. Photograph of patient's leg with lesion within donor site six weeks post STSG harvest.

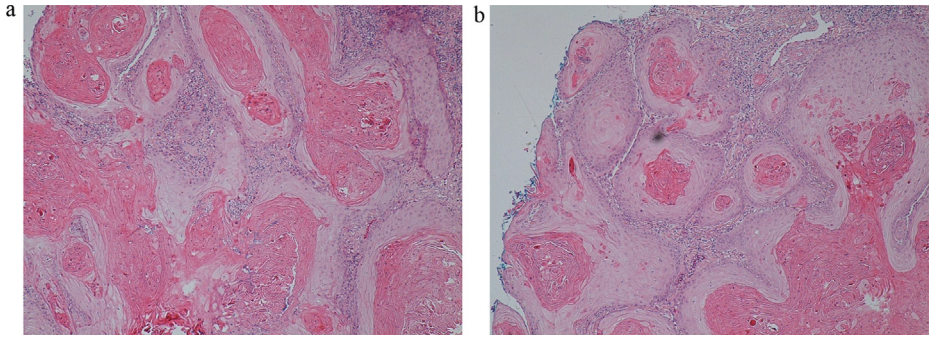

Figure 2. a. H&E staining showing keratin pearls typical of squamous cell carcinoma. b. H&E staining showing invasive well-differentiated squamous cell carcinoma.

Table 1
Comparing characteristics of previously described cases of KA and SCC arising in donor sites.

Year	Reference	Site of primary lesion	Nature of primary lesion	Donor site	Time of onset in donor site (months)	Malignancy occurring in donor site
1948	Jeremiah[7]	N/A	For scar contracture	Upper arm	6	SCC
1958	Wulsin JH[8]	Neck	BCC	Thigh	¾	KA
1987	Hammond et al.[9]	N/A	For acute burn	Thigh	3	SCC
1988	Neilson et al.[10]	Finger	SCC	Thigh	12	SCC
1989	Soto-de Delas et al.[11]	[a]	MM	Thigh	1 ½	KA
1994	Abadir and Zurowski[12]	Palm	SCC	Thigh	8	SCC
1997	Hamilton et al.[4]	N/A	For acute burn	Thigh	1	KA
1998	Taylor et al.[13]	N/A	For acute burn	Thigh	5	SCC
1999	Tamir et al.[5]	N/A	For acute burn	Thigh	4	KA
2008	Haik et al.[14]	Toe	MM	Thigh	1 ½	SCC
2010	May and Patil[6]	Orbit	SCC	Thigh	6	SCC
2011	Hussain et al.[15]	Hand	SCC	Thigh	2	SCC
2011	Ponnuvelu et al.[16]	Scalp	BCC	Thigh	½	SCC
		Leg	KA	Thigh	1¼	SCC
2013	Morritt and Khandwala[3]	Leg	SCC	Thigh	27	SCC
2014	Our report	Chest	MM	Thigh	1 ½	SCC

N/A – not applicable.
[a] Only the abstract was available for review which didn't include site of primary lesion.

case of SCC and one case of KA had developed following split thickness skin graft harvest to cover the defect following excision of a melanoma. The mean time for development of SCC was 6.6 months versus 7.3 weeks in reported cases of KA, comparable with our patient's six week interval.

In six of the eleven previously reported SCC cases, no clear causative factor is identified leading to the suggestion of a de novo lesion developing.[6] Close histological examination of the primary and donor site lesion in this case showed no similarity between the two and support a de novo lesion developing (Table 1). Risk factors such as Fitzpatrick skin Type I and UV light exposure are common to both melanoma and non-melanoma skin cancers. This further supports the development of a de novo SCC.

The development of SCCs donor sites is rare and several theories have been proposed. This case serves to highlight another case of de novo SCC development at a distant site. We propose an evaluation of the donor site at all surveillance examinations of the primary tumor site and urgent diagnostic biopsy of all non-healing and new lesions.

Funding

None.

Conflicts of interest

None declared.

Ethical approval

N/A.

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